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西双版纳传统利用的野生药食两用植物*

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摘要: 2010 年 3 月至 2011 年 7 月对西双版纳少数民族传统利用的药食两用植物进行民族植物学调查, 通过访谈和野外调查工作, 收集并记录了关于当地社区传统利用药食两用植物的传统知识以及其他相关信息, 并选择了其中 20 种植物进行抗菌活性的筛选。共调查统计了 43 科 95 种西双版纳传统利用的药食两用植物, 从分类学角度来看, 以茄科 (6 种) 和唇形科 (6 种) 最多, 其中草本植物占了最大比例, 为 49.5%。对其中 20 种植物的抗菌活性筛选结果显示, 只有马蓝 (*Baphicacanthus cusia*) 和旋花茄 (*Solanum spirale*) 对金黄色葡萄球菌有抑菌活性。从调查中可以看出: 药食两用植物的利用在当地人的日常生活中仍占有相当重要的分量。但随着近年来经济快速发展导致的传统知识的急剧流失和森林的大面积砍伐, 很多植物已经逐渐从人们的生活中淡出, 如何保护这些传统知识并使其能够可持续发展下去是一个值得思考的问题。

关键词: 西双版纳; 药食两用植物; 传统知识; 抗菌活性
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A Preliminary Study of Traditional, Wild Medicinal, Edible Plants in Xishuangbanna, Yunnan, China

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Abstract: An ethnobotanical study was conducted through interview and field work during 2010.3-2011.7 to determine the wild medicine-food plants used by the local people of Xishuangbanna, southwest Yunnan, China. All information provided on the uses of medicine-food plants by local communities was documented. In addition, the disk diffusion method was used to test the antibacterial activities of some plants. A total of 95 plant species belonging to 43 families were reported as medicine-food plants, with Solanaceae (6 species) and Lamiaceae (6 species) being the most represented families. Most plants used were herbs (49.5%), of which 20 were screened for antibacterial activities. *Baphicacanthus cusia* and *Solanum spirale* showed moderate antibacterial activities against *Staphylococcus aureus*. Our interviews revealed that in the study area wild plants are still commonly used for food and medicinal purposes

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by people in their daily lives. However, there is a gradual loss of traditional knowledge about these plants due to a decline in inter-generational transmission of knowledge. Loss of this precious knowledge is a major concern.

Key words: Xishuangbanna; Medicine-food plants; Traditional knowledge; Antibacterial activitiy

As people paying more attention to the health care, medicine-food plants plays more important role in modern time, especially in China, which has a long history to use the medicine-food plants. With the rapid development of economy and the rapid loss of biodiversity and traditional knowledge, a large number of traditional knowledge in minority nationalities is facing the danger of disappearing, documentation and evaluation of the traditional knowledge related to the diversity, usage, culture of medicine-food plants is crucial (Trotter and Logan, 1986).

Xishuangbanna is an area with high floristic and cultural diversity. Because of the close relationship with natural forest, all native ethnic groups have developed knowledge systems related to the use and conservation of natural resources (A *et al.*, 1999; Chen *et al.*, 1999; Li *et al.*, 1996; Pei, 1982). Earlier studies about Traditional Knowledge (TK) in Xishuangbanna have involved traditional cultivated plants (Yu *et al.*, 1985), traditional beverage plants (Pan *et al.*, 2006), and utilization of the wild vegetable (Li *et al.*, 2007), traditional aquatic plants (Fang, 2006) used by Dai people.

The present study focused on the ethnobotany of medicinal-edible plants used by local people living in Xishuangbana from ancient time. Several ethnic groups in Xishuangbanna such as Dai, Hani, Bulang were involved in this study. Ninety-five species were recorded in this research. Their food and medicinal function and other usage were documented. Additionally, 20 of these medicine-food species were screened for antibacterial activities.

1 Materials and methods

1.1 Study area

Xishuangbanna, a region of exceptional interest to biologists, is located in the south of Yunnan and bounded approximately by the geographical coordinates of 21°09′ and 22°36′ northern latitude, and of 99°58′ and 101°50′ eastern longitude. Xishuangbanna borders Laos to the east and south, and Burma to the southwest and to the north adjoins the plateau of Yunnan (Zhu, 1992). The region has mountain-valley topography with the Hengduan Mountains running north-south, and about 95% of the region is covered by mountains and hill. The altitude varies from 475 to 2 430 m above sea level (Li *et al.*, 2009). The vegetation can be divided into two major groups: tropical evergreen forests in the mountain areas, and tropical monsoon forests in the hilly areas (Li *et al.*, 1996).

1.2 Field study

The field ethnobotanical study was carried out in Xishuangbanna during several visits in 2010 and 2011. The investigated localities cover 12 villages of three counties (Jinghong, Menghai and Mengla) in Xishuangbanna, three ethnic groups (Dai, Hani, Bulang) were involved. Free-listing and semi-structured interview techniques were used. Research focused exclusively on medicine-food plants use and knowledge. Informants were chosen using the complementary strategies of snowball, purposive, and convenience sampling (Bernard, 2006). Forty key informants whom have great knowledge and experience about wild plants usage were selected in our interview. Information was compared with other areas and neighboring villages to verify the accuracy (Bahar and Sukran, 2013). Interviewees ranged in age from 20 to 82 years, 8 folk healers were included. Interview questions aimed at understanding traditional uses for medicine-food plants, including information on local plant names, ailments against which the plants were used, edible parts of the plants, and methods of preparation and administration. Specimens of the plants were collected and identified with the help of experts from Kunming Institute of Bota-

ny, Chinese Academy of Sciences.

Three major markets of Menglun, Menghan and Menghun were surveyed at least twice for analyzing marketing condition of traditional medicine-food plants. Surveys were conducted at the peak market hours between 7.00–10.00 am and 2.00–6.00 pm. Information was gathered on the plants parts used and quantities sold numbers of retailers in the market, prices and total volume available for each species (Jain *et al.*, 2011). Semi-structured interview techniques were used during the marketing survey.

1.3 Assay of antibacterial activity

The *in vitro* antibacterial effects of the methanol extract of 20 selected medicine-food plants on *Staphylococcus aureus* and *Escherichia coli* were determined with the disk diffusion method (Yang *et al.*, 2012). Filter paper disks (6.18 mm in diameter) impregnated with 40 μL sample solutions (mg/mL) were placed on cation-adjusted Mueller-Hinton agar plates, which had been inoculated with test organism, according to the standard protocol described by the National Committee of Clinical Laboratory Standards (NCCLS) (NCCLS 2002). The plates were incubated at 37 ℃, and the diameters of the inhibition zones were measured after 18 h. gentamicin was included as a control. Each assay was performed in triplicate and repeated at least two times. All of the analyses were performed to compare the mean or average values.

2 Results

2.1 Wild medicine-food plants diversity and frequently utilized species

According to our interview, there are 95 species (see Table 1) of medicine-food plants which belongs to 43 families were identified by local ethnic groups (Dai, Hani, Bulang). Solanaceae (6 species) and Lamiaceae (6 species) were the most represented families, followed by Araceae (5 species), and Acanthaceae (5 species). Most of the used plants (Figure 1) are herbs (49.5%), trees (25.3%) and shrubs (14.7%). Besides the medicinal and food function, there has 14.7% species have other uses.

Among these plants, common know species by all ethnic groups numbered 49. Eating bitter foods is a unique feature of the local diet, because of the hot and moist climate in Xishuangbanna, local people summarized through the diet regulating the balance of the body in a long time. They prefer sour (*Spondias pinnata*, *Ardisia solanacea*, *Citrus limon*, and so on), bitter (*Baphicacanthus cusia*, *Dregea volubilis*, *Solanum coagulans*, *S. spirale*, and so on), and spicy food. Another unique feature of the local diet is eating flowers. The most common edible flowers are *Gmelina arborea* (The powder of the dry flowers used for making the festival cake of Dai), *Buddleja officinalis* (the flowers used for adding into the rice as the coloring and flavoring agent), *Bauhinia uariegate* (the flowers used as vegetable) and so on.

2.2 Edible parts and cooking methods diversity

The local people choose the certain parts of each edible plant as food. For example, the young shoots and fruits of *Ficus auriculata* were used as vegetables; the flowers of *Buddleja officinalis* was used as pigment and flavor additive of rice; the flowers of *Mayodendron igneum* eaten as vegetables; the bracts of *Musa basjoo* flowers and the rhizome of *Houttuynia cordata* are also used as food. Through our investigation and statistics, the main edible parts of these plants are young shoots, flowers, rhizomes, leaves and fruits. Their cooking methods were decided by many factors, such as different seasons, different edible parts, even some edible plants has low toxicity. The common cooking methods include roasting, pounding, boiling, frying, steaming or making salad, the plants with low toxicity, for example, *Plumeria rubra* flowers, need to boiled and in water for a period of time before eating.

2.3 Medicinal uses of edible plants

The most common practice for the use of plants for medicinal purposes was to cut into pieces, grind into powder, rub, fry or decoct the medicinal herbs, make stew with chicken or spareribs, sparkle medicine wine, applied externally and so on.

Table 1 List of wild medicine-food plants investigated with their related information

Family	Species	Growth habit	Local name	Local use(s) (edible only)	Medicinal use(s)	Additional local use(s)
Acanthaceae	*Baphicacanthus cusia* (Nees) Bremek.	Herb	Huang man	Young shoots eaten as vegetable	Stem and leaves used for anti-inflammatory, antiseptics, heat-clearing and detoxifying	
	Dipliptera riparia Ness var. *yunnanensis*	Herb		Young shoots eaten as vegetable	Herb used to treat rheumatic arthritis and cold	
	Mananthes patentiflora (Hemsl.) Bremek	Herb		Young shoots eaten as vegetable	The herb used to treat traumatic injury	
	Pseuderanthemum polyyanthum (C.B. Clarke) Merr	Herb		Flowers eaten as vegetable	The herb used for the wound inflammation and cure traumatic injury	
	Thunbergia grandiflora (Rottl. ex Willd.) Roxb.	Herb		Flowers eaten as vegetable	Roots and leaves can used to treat stomach trouble	
Anacardiaceae	*Mangifera indica* Linn.	Tree	Ma meng	Fruits can edible	The fruits used as stomachic tonic; the stone heat-clearing and detoxifying medicine	
	Spondias pinnata (Linn.) Kurz	Tree	Wai mu ge	Fruits and young shoots eaten as vegetable	The fruits and stem bark used as heat-clearing and relieving cough and resolving phlegm medicine	Bark can use for extraction of tannin; the sap can used to bond pills
Angiopteridaceae	*Angiopteris nuda* Ching	Herb	Ge gu ji ma	Young shoots eaten as vegetable	The rootstock used for expelling wind and scattered stasis detumescence, heat-clearing and detoxifying, relieving uneasiness of mind and body tranquilization	
Apocynaceae	*Ecdysanthera rosea* Hook. et Arn.	Liana	Ji feng mei	Young shoots eaten as vegetable	The whole plants used to cure rheumatalgia, traumatic injury and sore, chronic enteritis and so on.	The whole plants can used for Extraction of latex
	Amalocalyx yunnanensis Tsiang	Vine		Young shoots and young fruits eaten as vegetable	Roots used as galactogogue	
	Plumeria rubra '*Acutifolia*'	Tree	Guo luo zhang ba die	Flowers eaten as vegetable	The flowers used to cure sunstroke, dysentery, stomachache and cough	
Araceae	*Alocasia macrorrhiza* (Linn.) Schott	Herb		Petiole eaten as vegetable	Roots used as heat antidotes, scattered stasis detumescence and detoxification medicine	
	Amorohophalms konjac K. Koch.	Herb		Rhizome edible	Roots used as reducing swelling, detoxification and pain relief medicine	
	Colocasia esculenta (Linn.) Schott var. *illustum* Schott	Herb		Young flowers eaten as vegetable	Roots used to treat weakness	
	Colocasia gigantea (Bl.) Hook. f.	Herb		The petiole eaten as vegetable	Roots used for detoxification and pain relief	
	Lasia spinosa (L.) Thwaites [*L.heterophylla* Schott]	Herb		Young shoots eaten as vegetable	Rhizome used to treat chronic gastritis, rheumatic arthritis and so on	—
Araliaceae	*Acanthopanax senticosus* (Rupr. et Maxim.) Harms	Shrub		Young shoots eaten as vegetable	Root bark used to treat rheumatism	
	Kalopanax stptemlobus (Thunb.) Koidz.	Tree		Young flowers and young shoots eaten as vegetable	Roots and bark used as relieving fevers medicine	Timber can used to make furniture, instrument and so on
	Aralia armata (Wall.) Seem.	Tree		Young shoots eaten as vegetable	Bark used to treat hepatitis, nephritis, prostatitis	

Table 1 continued

Family	Species	Growth habit	Local name	Local use(s) (edible only)	Medicinal use(s)	Additional local use(s)
Asclepiadaceae	*Marsdenia tinctoria* R. Br.	Scandent subshrubs		Young shoots eaten as vegetable	Fruits used for dispersing stagnated liver qi for regulating stomach	
	Cyptolepis sinensis (Lour.) Merr.	Vine		Young shoots eaten as vegetable	The whole plant used to treat consumption, stomach bleeding, snake bite and so on	
	Dregea volubilis (Linn. f.) Benth. ex Hook. F.	Vine	Pa kong song	Young shoots eaten as vegetable	Roots used as emetic	Stem bark used to make ropes and artificial cotton
Asteraceae	*Enydra fluctuans* Lour.	Herb	Ya jing bu	Young shoots eaten as vegetable	The herb used to treat urticaria, diarrhea, nausea and vomiting	
	Sonchus oleraceus L.	Herb		Young shoots eaten as vegetable	The herb used to cure enteritis, dysentery, icteric hepatitis and appendicitis	
Bignoniaceae	*Dolichandrone caudafeline* (Hance) Benth. Et Hook. f.	Tree	Mai guo jie	Flowers and fruits eaten as vegetable	Leaves used for heat-clearing and detoxifying	
	Mayodendron igneum (Kurz) Kurz	Tree	Guo luo bi	Flowers eaten as vegetable	The bark, stem and root bark can used to cure dysentery and diarrhea	—
	Oroxylum indicum (Linn.) Vent.	Tree	Guo leng ga	Fruits and flowers can edible	Seeds and bark used as anti-inflammatory and analgesic medicine	
Bombacaceae	*Bombax malabaricum* DC.	Tree	Ge niu	Flowers eaten as vegetable	Flowers used to cure diarrhea, enteritis; Bark used to treat diarrhea and menoxenia	Fibre used to make textile
Caesalpiniaceae	*Cassia siamea*	Tree	Mai xi lie	young shoots and flower eaten as vegetable	The heartwood and leaves used for relieving rheumatism, chills and pains, relieving itching	The heartwood can used to make furniture; the bark and the pods can used for extraction of tannin extract
	Tamarindus indica Linn	Tree	Mu han	Fruits can edible	Fruit used to treat sunstroke, jaded appetite, mallnutrition and indigestion syndrome in children, vomiting of pregnancy and constipation	The plants is a nectar plant; the leaves can be used to feet Cows and sheep; the young shoots can be used to Stocking lac insect; the heartwood can used to make furniture, boat and so on
Capparaceae	*Cleome gynandra* L.	Herb		Young shoots eaten as vegetable	The herb used to treat rheumatic arthritis, bones injuries and hemorrhoids	
	Crateva unilocularis Buch.-Ham.	Tree	Pa gong	Young shoots eaten as vegetable	Roots used to treat hepatitis and diarrhea	
Caricaceae	*Carica papaya* Linn.	Tree	Ma gui sha bao	Fruits, young shoots and male flower eaten as vegetable	Fruits, roots and leaves used to treat abdominal distention, headache	—
Chenopodiaceae	*Chenopodium athun* L.	Herb	Ge xia wo niu (ha ni)	Young shoots eaten as vegetable	The stem, leaves and seed used to treat cold, dysentery and diarrhea	
Commelinaceae	*Commelina benghalensis* Linn.	Herb		Young shoots eaten as vegetable	The herb used to treat infant pneumonia, difficulty in urination, Furuncle swollen	

Table 1 continued

Family	Species	Growth habit	Local name	Local use(s) (edible only)	Medicinal use(s)	Additional local use(s)
	Commelina communis Linn.	Herb		Young shoots eaten as vegetable	The herb used to treat edema, dermatophytosis, difficulty in urination, cough, mumps and so on	
Compositae	*Crassocephalum crepidioides* (Benth.) S. Moore	Herb		Young shoots eaten as vegetable	The herb used to treat fever, colds, dysentery and enteritis *et al.*	—
	Gnaphalium affine D. Don	Herb	Ya muo fie	Flowers used as the material of cake	The herb used to treat cough, high blood pressure, rheumatism and so on	
	Vernonia volkameriaefolia (Wall.) DC.	Small tree	Dang hao wen	Young shoots eaten as vegetable	The whole plants used to cure urinary calculus, headache and so on	
Convolvulaceae	*Dichondra repens* Forst.	Herb		Young shoots eaten as vegetable	Herb used to treat icteric hepatitis, diarrhea, fracture, injury	
Cucurbitaceae	*Gynostemma pentaphylla* (Thunb.) Makino	Herbaceous vines	Ya ha bai	Young shoots eaten as vegetable	The herb used for heat-clearing, detoxifying and slimming	
	Momordica cochinchinensis	vine	Ma xi ga	Young shoots eaten as vegetable	Roots, leaves and seeds used to treat dermatophytosis, hernia, hemorrhoids, freckles and so on	
Elaeagnaceae	*Elaeagnus conferta* Roxb.	Shrub	Ma luan	Fruits can edible	Roots, leaves and fruits used to cure indigestion, cough, and hemorrhoids and so on	
Euphorbiaceae	*Antidesma acidum* Retz	Shrub	Song men	Young shoots eaten as vegetable	Roots, stem and leaves used for anti-inflammatory, antiseptics, analgesia and detoxify	
	Antidesma montanum Bl.	Shrub		Young shoots eaten as vegetable	Roots, stem and leaves used for anti-inflammatory, antiseptics, analgesia and detoxify	
	Sauropus androgynus (Linn.) Merr. (Euphorbiaceae)	Shrub	Ha pa wan	Young shoots eaten as vegetable	Roots used to treat tonsillitis	
	Phyllanthus emblica Linn. (Euphorbiaceae)	Tree	An mo le	Fruits can edible, bark used as condiment	Fruits used to cure abdominal distension, cough and so on	Seeds can used to make soap; timber used to make furniture
Gramineae	*Cymbopogon citratus* (D. C.) Stapf	Herb	Sha hai	Stem and leaves eaten as condiment	The herb used to treat fever, colds, abdominal pain, diarrhea and dermatophytosis	Stem and leaves used for extracting essential oils
Lamiaceae	*Elsholtzia communis* (Coll. et Hemsl.) Diels	Herb	Ying xin	Young shoots used as condiment and beverage	stems and leaves used to treat cold, cough, pharyngitis	
	E.fruticosa	Herb		Whole plant used as condiment	Roots used to cure rheumatic arthritis	
	E.kachinensis Prain	Herb	An nan mu	Young shoots eaten as vegetable	The herb have regulating qi-flowing for strengthening spleen function	—
	Mentha haplocalyx Briq.	Herb		Young shoots eaten as vegetable	The herb used to treat influenza and sore throat	
	Ocimum basilicum var. *pilosum* (Willd.) Benth.	Herb	Guang guo	Young shoots eaten as vegetable	The herb used to treat measles, traumatic injury and urticaria	
	Perilla frutescens	Herb	Zha a liang	Young shoots eaten as vegetable	Herbs used as relieving fever medicine	
Leguminosae	*Bauhinia uariegate* Linn.	Tree	Mai xiu	Flowers eaten as vegetable	Bark used to treat cough, diarrhea, eczema *et al.*; leaves used to treat cough; flowers used to cure pneumonia and bronchitis	

Table 1 continued

Family	Species	Growth habit	Local name	Local use(s) (edible only)	Medicinal use(s)	Additional local use(s)
	Acacia pennata (Linn.) Willd.	Vine	Ha pa la	Young shoots eaten as vegetable	Stem bark used to treat lassitude	
	Acacia sinuata (Lour.) Merr	Vine		Young shoots eaten as vegetable	Fresh leaves used to treat abdominal and teeth pain	
Loganiaceae	*Buddleja officinalis* Maxim.	Shrub	Ran fan hua	Flowers used for rice-coloring	Flowers used to treat eye diseases	—
Marantaceae	*Phrynium capitatum* Willd.	Herb		Leaves used as food packaging	Herbs used as relieving fever medicine	
Moraceae	*Ficus tikoua* Bur.	Liana		Fruits can edible	The roots used to cure jaundice, dysentery, hemorrhoids, and gynecological disorders	
	Broussonetia papyifera (Linn.) L'Hert. ex Vent. (Moraceae)	Tree	Ge sha	Flowers and young shoots eaten as vegetable	Fruits used to cure soreness and weakness of waist and knees, impotence, blurring of vision, and edema; the sap can used to treat a lot of skin diseases	Bark used as the material for paper-making
	Ficus auriculata Lour.	Tree		Young shoots eaten as vegetable	Leaves used to treat injury and blood	Leaves used as food packaging
	Ficus maclellandi var. *rhododendrifolia* Corner	Tree		Young shoots eaten as vegetable	Leaves used to treat injury and blood	—
Musaceae	*Musa basjoo* Sieb. et Zucc.	Herb		Flowers eaten as vegetable	Leaves can use to prevent epidemics; fruit can treat constipation; the roots used to cure all the pain	Leaves used as food packaging
	Musella lasiocarpa	Herb		Flowers eaten as vegetable	The stem juice can used for antialcoholism and detoxification; the flowers have the function of constringency and hemostasia	
Myrsinaceae	*Ardisia solanacea* Roxb.	Shrub	Pa lei	Young shoots eaten as vegetable	—	—
	Embelia ribes Burm. F.	Shrub	Ma gui lang	Young shoots eaten as vegetable	The roots used to treat gynecology and traumatic injury	
Myrtaceae	*Psidium guajava* Linn.	Tree	Ma gui xiang la	Fruits can edible; the leaves used to make tea	The leaves and fruits used to cure traumatic injury, enteritis, dysentery and so on	
Papilionaceae	*Sesbania grandiflora* (L.) Pers.	Tree	Luo jie	Young shoots and flowers eaten as vegetable	Bark used as apocrustia	
Parkeriaceae	*Ceratopteris thalictroides* (L.) Brongn.	Herb		Young shoots eaten as vegetable	The whole plants used to cure injury, abdominal mass in the abdomen and dysentery	
Piperaceae	*Piper longum* Linn.	Herb	Pa xie	Young shoots eaten as vegetable	Roots, leaves and fruits used to treat heat-clearing and detoxifying, cooling blood for hemostasis and so on	
	Piper sarmentosum Roxb.	Herb	Diu bing mi	Young shoots eaten as vegetable	The roots used to cure traumatic injury, cough and rheumatic arthritis; the fruits used to treat toothache, stomachache and abdominal distension	
Polygonaceae	*Polygonum aviculare* L.	Herb		Young shoots eaten as vegetable	The herb used to treat dysmenorrheal and fever	
Polygonaceae	*Polygonum capitatum* Buch.-Ham.	Herb		Young shoots eaten as vegetable	The herb used to treat nephritis	

Table 1 continued

Family	Species	Growth habit	Local name	Local use(s) (edible only)	Medicinal use(s)	Additional local use(s)
	Polygonum hydropiper L.	Herb		Young shoots eaten as vegetable and condiment	The herb used for subdhing swelling and detoxicating	
	Rumex crispus Linn.	Herb		Herbs can used as condiment	The herb used to cure skin disease	—
Pteridiaceae	*Pteridium aquilinum* (Linn.) Kuhn var. *latiusculum* (Desv.) Underw. ex Heller	Herb		Young shoots eaten as vegetable	Herbs used to treat fever, dysentery, rheumatic arthritis, high blood pressure and so on	Starch can make many kind of food
Rosaceae	*Pyrus calleryana* Dcne. Jard. Fruit.	Tree		Young flowers eaten as vegetable	Roots and leaves used to treat acute ceratitis, cough, and dysentery and so on	
Rutaceae	*Citrus limon*	Small tree	Ma nao	Fruits used for condiment and beverage	Fruits and roots used for heat-clearing, swelling analgesic, bronchiectasis	
Saururaceae	*Houttuynia cordata* Thunb.	Herb	Pa hao duan	Young shoots and root crown eaten as vegetable	The herb used to treat enteritis, dysentery, nephritis and so on	
Scrophulariaceae	*Lianophila rogosa* (Roth.) Nerr.	Herb	Nian bag no(ha ni)	Young shoots eaten as vegetable	The herb used to cure cold, caugh and sore throat	
Solanaceae	*Solanum coagulans* Forsk	Herb	Ma he leng	Fruits used as vegetable	Fruits used to cure tinea, paronychia, and vomiting	
	S.nigrum Linn.	Herb		Young shoots eaten as vegetable	Whole plants used as heat-clearing medicine	—
	S.spirale Roxburgh	Shrub	Pa li	Young shoots eaten as vegetable	Whole plants used as heat-clearing medicine	
	S.suffruticosum Schousb.	Shrub		Young shoots eaten as vegetable	Whole plants used as heat-clearing medicine	
	S.torvum	Shrub		Young fruits used as vegetable	Whole plants used to scattered stasis detumescence, Detoxification	
	S.verbacifolium Linn.	Shrub	Ge ma hei	Young shoots eaten as vegetable	Whole plants have anti-inflammatory, relieve pain and relieve itching functions	
Umbelliferae	*Centella asiatica*	Herb		Stem and leaves eaten as vegetable	The herb was used to cure sunstroke, diarrhea *et al*.	The plants can used to make cosmetic
	Oenanthe benghalensis (Roxb.) Benth.	Herb		Young shoots eaten as vegetable	The herb used to cure fever, colds, diarrhea and gynopathy	
	Oenanthe javanica (Bl.) DC.	Herb		Young shoots eaten as vegetable	The stem and leaves can used for clearing heat and promoting dieresis, stomachic tonic and liver protection	—
	Eryngium foetidum	Herb		Leaves used as condiment	The herb used to cure cold, tracheitis, enteritis and dysentery	
Verbenaceae	*Clerodendrum japonicum* (Thunb.) Sweet	Shrub	Bin liang	Flowers eaten as vegetable	Roots and leaves used to treat chest tightness, menoxenia	
	Gmelina arborea Roxb.	Tree	Mai suo	Flowers used as the material of cake	The heartwood leaves and bark used to treat liver diseases, injury, and eczema and so on	The wood used to make furniture, figure, and boat and so on
Vitaceae	*Cissus repens* Lamk. Encucl.	Vine	Hei song xie	Young shoots eaten as vegetable	The stem and roots used to cure Virus gall	
Zingiberaceae	*Amomum maximam* Roxb.	Herb	He gu	Fruits edible	Roots used to cure abdominal pain, abdominal disrension, indigestion	

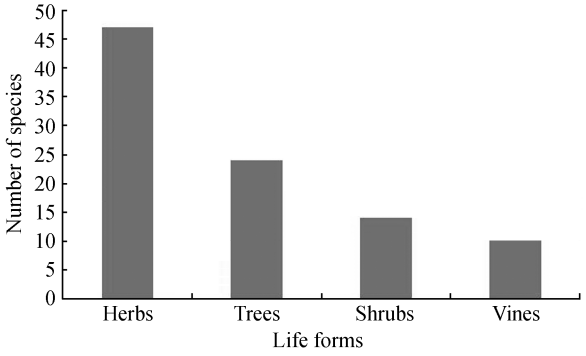

Fig.1　Frequency of wild edible plant taxa arranged by life forms

The most common diseases or ailments that were treated with local traditional medicine-food plants were cold and fever/cough (30 species), dysentery and diarrhea (18 species), cuts and injury (15 species) and indigestion (12 species).

2.4　Results of antibacterial activity testing

Twenty of these medicine-food species were screened for antibacterial activities. According to *Microbial Test Technology* (Gou and Wang, 2008), with the diameter of inhibition zone characterizing antibacterial performance, the diameter of inhibition zone is more than 20 mm indicating that the tested sample belonging to the level of high sensitive, the diameter of inhibition zone is between 10–19 mm indicating that the tested sample belonging to the level of medium sensitive, and if the diameter of inhibition zone is less than 10 mm indicating that the tested sample belonging to the level of muting sensitive. The results (see Table 2) indicated that the only methanol extract of *Baphicacanthus cusia* (the diameter of inhibition zone is 19.84 ± 4.09 mm) and *Solanum spirale* (the diameter of inhibition zone is 10.90 ± 1.44 mm) showed the moderate antibacterial activities on *Staphylococcus aureus*, the other plants showed no any antibacterial activities on *Staphylococcus aureus* and *Escherichia coli*.

Table 2　Antibacterial activity of selected 20 medicine-food plants

Sample[α]	Test strains [*]	
	Staphylococcus aureus	*Escherichia coli*
	Diameter of inhibition zone/mm	Diameter of inhibition zone/mm
Mayodendron igneum	—	—
Bauhinia uariegate	—	—
Baphicacanthus cusia	19.84 ± 4.09	—
Plumeria rubra 'Acutifolia'	—	—
Musella lasiocarpa	—	—
Eryngium foetidum	—	—
Dregea volubilis	—	—
Spondias pinnata	—	—
Solanum verbacifolium	—	—
Acacia pennata	—	—
Solanum spirale	10.90 ± 1.44	—
Musa basjoo	—	—
Cassia siamea	—	—
Ceratopteris thalictroides	—	—
Clerodendrum japonicum	—	—
Perilla frutescens	—	—
Momordica cochinchinensis	—	—
Angiopteris nuda	—	—
Crateva unilocularis	—	—
Dolichandrone caudafeline	—	—
Gentamicin	30.96 ± 1.01	26.59 ± 1.10

[α] The dried and finely ground samples were extracted by the ethanol, The ethanol solutions were vacuum dried and dissolved in DMSO.

[*] All data are shown as the means± standard deviation for triplicate determination in the same test strain

3　Discussion

The Multifunctional Characters of traditional herbal plants is one of the common characteristics of Chinese traditional medicine, a lot of edible plants also can used as medicine. The local people in Xishuangbanna have a long history to use the wild plants for different purposes. In their traditional culture, a typical ethnic trait is the homology of medicine and food. But in recent times, the old traditions in many tribal communities are at the risk and gradually decline; hence, there is urgent need to study such knowledge systems and find innovative ways of tapping their potential for the welfare of mankind (Rasingam and Rehel, 2009).

Our interviews revealed that in the study area plants are still commonly used for food and medicinal purposes by people in their daily lives. However, there is a gradual loss of traditional knowledge about these plants as the inter-generational transmission of

knowledge is declining (Bahar and Sukran, 2013). The medicine-food plants which were sold in the markets are becoming scare, along with the deforestation, many plant species facing endangerment, actually, on condition of resource scarcity, these traditional knowledge is seems particularly valuable. How to preserve this precious knowledge effectively and let them get sustainable utilization is a problem worth deeply thinking.

The research of traditional knowledge about medicinal-edible plants not only can provide new ideas for the modern development of medicinal plants, but also can provide new clues and scientific supports for looking for new plant health products.

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